KINDERGARTEN MATHEMATICS

GRADE LEVEL CONTENT EXPECTATIONS

K MATH

v.4.04

NUMBER & OPERATIONS

ALGEBRA

MEASUREMENT

GEOMETRY

DATA & PROBABILITY

Welcome to a preview of Michigan's mathematical future! This document not only introduces Michigan's new Grade Level Content Expectations for mathematics, it also establishes high expectations in mathematics to better prepare all K-12 Michigan students for the challenges of the future.

Creating grade-level expectations involves a complex combination of understanding of mathematics, curriculum, student learning, teaching, current practices, and policy. Curriculum directors, mathematics educators, and classroom teachers from Michigan school districts across the state, together with mathematics and mathematics education faculty from universities across the state, have been involved in the development and/or review of the **Michigan Mathematics Grade Level Content Expectations.** The GLCE are intended to be usable as a framework for the development of grade-by-grade assessments, and to provide teachers with a guide for their instructional and curricular emphases in classrooms. The expectations were constructed to feature continuity from one grade to the next, and to ensure coherence both mathematically and pedagogically. These expectations represent a challenge toward which to aspire; in some cases, teachers and mathematics educators will be called on to move beyond their current practice and experience into territory that will be both demanding and rewarding. Michigan students can rise to the challenge of high academic standards. This document provides a set of ambitious goals for all of us.

This document is intended to be an assessment tool. This means students will be expected to be proficient in the concepts and skills included in this document at the end of the indicated grade level. These expectations are written to convey intended performances by students. The expectations here generally represent key landmarks in mathematics learning — areas where students are expected to have consolidated their understandings and skills. Thus it does not attempt to elaborate all of the precursor ideas and concepts that lead to a particular expectation in a particular grade level — it instead assumes that teachers will build up to the expectations through exploration and development of concepts and processes

The Grade Level Content Expectations are not designed to be a curriculum document, or to function as a scope and sequence framework. It is not designed to suggest the various pedagogical options and strategies that might best enable students to attain these expectations. Rather, it should serve as a basis for the development of a curriculum and instructional strategies that would help the students attain the concepts and skills necessary to meet the GLCE. Various groups are being organized

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to develop clarification documents, content examples, more elaborated explanations, and suggestions for professional development that would support these expectations. Ultimately, teachers, school personnel and district leaders will need to collaborate and draw on their own professional wisdom and experience, as well as on research, to decide how best to organize instruction to help their students meet these expectations.

The mathematics content expectations have been organized into five strands: Number and Operations, Algebra, Geometry, Measurement, and Data and Probability.

These expectations are being presented in two formats; one designed to show specific grade level expectations and a second to show how the expectations transition from one grade level to the next. In the **grade level** format the expectations are organized first by the five strands. Each of the strands is then broken down into content pieces titled "Topics" in an attempt to cluster related ideas for teaching continuity. Under each "Topic" are listed the expectations.

The second format is a "**cross-grade**" version, which has been designed with the intent that one grade level can be easily compared with another and to highlight the mathematical growth that is envisioned across the grades. This format also has been organized into the five strands. However, each strand has been subdivided into broader, more conceptual groupings called "Domains," to allow for cross grade comparison of the expectations. In several of the strands, the "domains" are similar to the "standards" in *Principles and Standards for School Mathematics* from the National Council of Teachers of Mathematics. In the "cross-grade" version, some key expectations are "cross-listed" in grey when they seem especially crucial to the development of another strand. For instance, several strands from the Number and Operations strand are also listed in grey in the Algebra strand.

Although this organization does not include what have typically been called "process" strands, the importance of mathematical process in the development of these proficiencies cannot be underestimated. Embedded within these expectations are emphases on representation, problem solving, and reasoning as appropriate. The importance of making mathematical connections is conveyed through the cross listing. Finally, the process of communication is foundational to all of mathematics learning.

With the cooperation of all those involved in the education of Michigan students, we can enable our young people to attain the highest standards – and thereby open doors for them to have fulfilling and successful lives in a quantitatively and technologically complex future.

KINDERGARTEN

The big ideas for kindergarten children are in the area of number. The Expectations at Kindergarten emphasize counting, grouping, and ordering numbers. Teachers should emphasize meaning, naming, and patterns.

NUMBER AND OPERATIONS

Count, write, and order numbers

N.ME.00.01 Count whole numbers and recognize how many objects are in sets to 30.

N.ME.00.02 Use one-to-one correspondence to compare and order sets of objects to 30 using such phrases as "same number", "more than", or "less than"; use counting and matching.

N.ME.00.03 Compare and order numbers to 30 using phrases such as "more than" or "less than."

N.ME.00.04 Read and write numerals to 30 and connect them to the quantities they represent.

N.ME.00.05 Count orally to 100 by ones. Count to 30 by 2s, 5s and10s using grouped objects as needed.

Compose and decompose numbers

N.ME.00.06 Understand the numbers 1 to 30 as having one, or two, or three groups of ten and some ones. Also count by tens with objects in ten-groups to 100.

N.MR.00.07 Compose and decompose numbers from 2 to 10, e.g., 5= 4 +1 = 2+3, with attention to the additive structure of numbers, e.g., 6 is 1 more than 5, 7 is one more than 6.

N.MR.00.08 Describe and make drawings to represent situations/stories involving putting together and taking apart for totals up to 10; use finger and object counting.

Add and subtract numbers

N.MR.00.09 Record mathematical thinking by writing simple addition and subtraction sentences, e.g., 7 + 2 = 9, 10 - 8 = 2.

Explore number patterns

N.MR.00.10 Create, describe, and extend simple number patterns.

MEASUREMENT

Explore concepts of time

M.UN.00.01 Know and use the common words for the parts of the day (morning, afternoon, evening, night) and relative time (yesterday, today, tomorrow, last week, next year).

M.TE.00.02 Identify tools that measure time (clocks measure hours and minutes; calendars measure days, weeks, and months).

M.UN.00.03 Identify daily landmark times to the nearest hour (lunchtime is 12 o'clock; bedtime is 8 o'clock)

Explore other measurement attributes

M.UN.00.04 Compare two or more objects by length, weight and capacity, e.g., which is shorter, longer, taller?

M.PS.00.05 Compare length and weight of objects by comparing to reference objects, and use terms such as shorter, longer, taller, lighter, heavier.

GEOMETERY

Create, explore, and describe shapes

G.GS.00.01 Relate familiar three-dimensional objects inside and outside the classroom to their geometric name, e.g., ball/sphere, box/cube, soup can/cylinder, ice cream cone/cone, refrigerator/prism.

G.GS.00.02 Identify, sort and classify objects by attribute and identify objects that do not belong in a particular group.

Explore geometric patterns

G.GS.00.03 Create, describe, and extend simple geometric patterns.